

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following Remarks and discussion is respectfully requested.

Claims 11-15 are pending in this application. By this amendment, Claims 1-10 are canceled, and Claims 11-15 are added. It is respectfully submitted that no new matter is added by this amendment.

In the Office Action, Claims 1-3, and 6 were rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,192,827 to Welch in view of JP11-037315 to Osaka and U.S. Patent No. 4,771,805 to Maa; Claims 4 and 7 were rejected under 35 U.S.C. §103(a) as unpatentable over Welch, Osaka, and Maa and further in view of U.S. Patent No. 5,242,538 to Hamrah; Claims 5, 8 and 9 were rejected under 35 U.S.C. §103(a) as unpatentable over Welch, Osaka, Maa and further in view of U.S. Patent No. 5,788,799 to Steger; and Claim 10 was rejected under 35 U.S.C. §103(a) as unpatentable over Welch, Osaka, Maa, Steger and Hamrah. It is respectfully requested that the rejections of the claims be withdrawn, and that the claims be allowed, for the following reasons.

Claim 11 recites in part, a notch portion located opposite to a carrier port which is provided at the processing chamber to allow the substrate to be carried out from and into the processing chamber, the notch portion being formed in a lower portion of the deposit shield, a shutter including an end face which is shaped to be fitted to a cut end face of the notch portion such that the end face of the shutter and the side curved-surface portion have a continuously even and curved inner surface, the shutter functioning to maintain uniformity of a density of plasma generated in the plasma processing. In accordance with the features discussed above, the deposit shield is designed to have a surface to be exposed to plasma such that the surface is not irregular, and to make plasma uniform in density.

It is respectfully submitted that none of the references of record, including Welch, Osaka, Maa, Steger and Hamrah, whether taken alone or in combination with one another, disclose or render obvious the above-discussed claimed features recited in the independent claims. It is therefore also submitted that these references do not teach or suggest the above-described advantages that are provided by one or more examples of the present invention.

Welch discusses that the inner slit passage door 60 is curved to match the radius of the chamber liner assembly 50, as shown in Fig. 3B. The inner slit passage door 60 fits in a slit door recess 54 in the chamber liner assembly 50. Accordingly Welch merely discloses that the radius of curvature of the door 60 matches the radius of curvature of the chamber.

Welch further discusses in column 7, lines 22 to 38 and FIG 10, the gap dimensions 88 and 90. The gap dimensions 88 and 90 serve to inhibit generated plasma from moving into the trans passage. As can be clearly seen in FIG. 10, a passage door 60 and upper and lower chamber liner portions 94 and 96 do not touch with each other. With the gap, it is possible to prevent the generation of particles that results from the contact between these members. Even further, it can be clearly seen in Fig. 10 that a large gap exists between the liner inner wall portions 94 and 96 and the door 60. Therefore, Welch does not teach or suggest a shutter including an end face which is shaped to be fitted to a cut end face of the notch portion such that the end face of the shutter and the side curved-surface portion have a continuously even and curved inner surface, as recited in the claimed invention.

Osaka discloses a gate valve in which a valve element 32 having a tapered surface on which a sealant 32 is mounted, in tight contact with a valve seat 28, as shown in FIG. 2(B) and as discussed in the Abstract.

As described above, Welch et al. achieves its effect without making the passage door 60 in tight contact with the portions (without touching), whereas Osaka discusses a gate valve that achieves a sealing effect by making the valve element 32 in tight contact with the seat.

Therefore, the combination itself of these references is not reasonable or obvious, and a person having ordinary skill in the art would not easily conceive such a combination.

Claim 11 further recites an O-ring fitted in the end face of the shutter which is fitted to the cut end face of the notch portion and a spiral seal fitted in the end face of the shutter, located closer to an outer periphery of the shutter, and formed of metal to effect electrical conduction on the shutter. As clearly shown in Fig. 10 of Welch, the end portions of door 60 do not contact portions of surrounding areas of the device. It is respectfully submitted that there is no basis in the teachings of the applied art to modify Welch to form an O-ring in an end face of door 60 to fit with a portion of the notch. Certainly, the outstanding Office Action fails to cite to any specific teachings within the references to support this combination. In accordance with these features, the spiral seal functions as an elastic member when the shutter is opened/closed, and uniformly electrically connects the deposit shield and the shutter, preventing leakage of plasma. Furthermore, since an O-ring is provided inward of the spiral seal (on the vacuum chamber side), metal particles generated from the spiral ring are prevented from spreading to the processing area.

The combination of features recited in the independent claims can provide a vacuum processing apparatus well suited to form a film or etch for a substrate to be processed by a semiconductor manufacturing technique using plasma. Specifically, by providing the features of the claims discussed above, plasma can be prevented from spreading into a carrier port for carrying a substrate to be processed into and out of a chamber when plasma is generated. Thus, disorder of the plasma can be eliminated to ensure a uniform plasma processing which is simple in structure and can be made small in size.

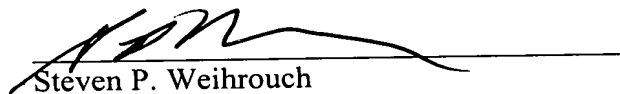
For at least the reasons discussed above, withdrawal of the rejection of the claims under 35 U.S.C § 103(a) is respectfully submitted.

Consequently, for the reasons discussed in detail above, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. Therefore, a Notice of Allowance is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Respectfully submitted,

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